

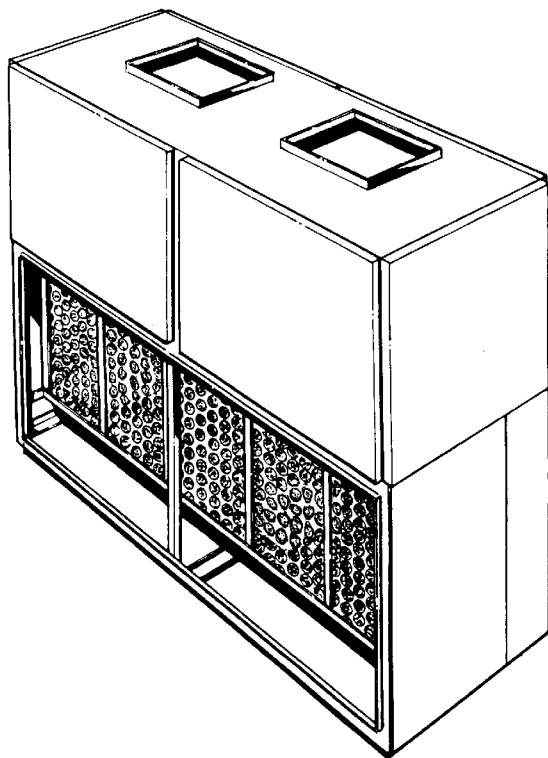
TECHNICAL GUIDE

SPLIT-SYSTEM

EVAPORATOR BLOWER

KBC, KBU, LDBC240

20 NOMINAL TONS



DESCRIPTION

This 20 ton evaporator blower is designed with two distinct modules to provide maximum application flexibility. The units are shipped as single packages with the blower module mounted on top of the coil module, but the blower module can be repositioned in the field to meet almost any installation requirement.

The blower module includes the blower wheels and room for a field-mounted motor and drive. The coil module includes direct expansion coils, one-inch throwaway filters, 1 liquid line solenoid valve for 50% capacity reduction, thermal expansion valves, distributors and a condensate drain pan.

Each evaporator coil is pressurized with air to 325 psig and leak tested under water. After the headers are brazed onto the coil and the coil is installed in the unit, the coil will be pressurized with a combination of refrigerant-22 and nitrogen to 150 psig for pressure testing and additional leak testing. After the coil is evacuated and dehydrated, it will be pressurized with a holding charge of Refrigerant-22 for storage and/or shipping.

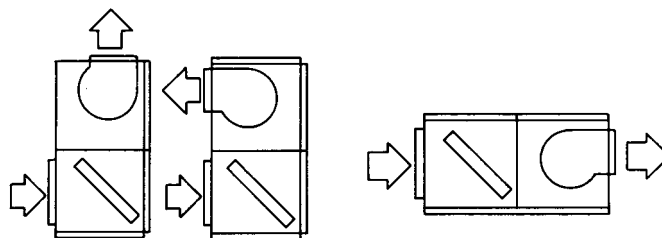
A supply air plenum, return air grille, steam coil, hot water coil, base section, suspension hardware, blower motors and drive accessories are available for field-installation to provide additional application flexibility.

This evaporator blower, applied with a matching condensing unit, will provide years of quiet, efficient and dependable operation.

FEATURES

APPLICATION FLEXIBILITY - This evaporator blower can be arranged for a variety of air discharge patterns in either the horizontal or the vertical position.

The following illustration shows three of the more common installation arrangements. Refer to the unit installation instruction for other possibilities.



The unit can be bottom-supported or ceiling-suspended and can be arranged to meet almost any space or duct requirements. Each unit is available with a choice of blower motors, drive packages plus other accessories to make them suitable for most applications.

PART LOAD OPERATION - The unit requires no field modifications for part load operation. Capacity reduction not only provides economical operation but also maintains more even temperature and humidity levels in the conditioned space.

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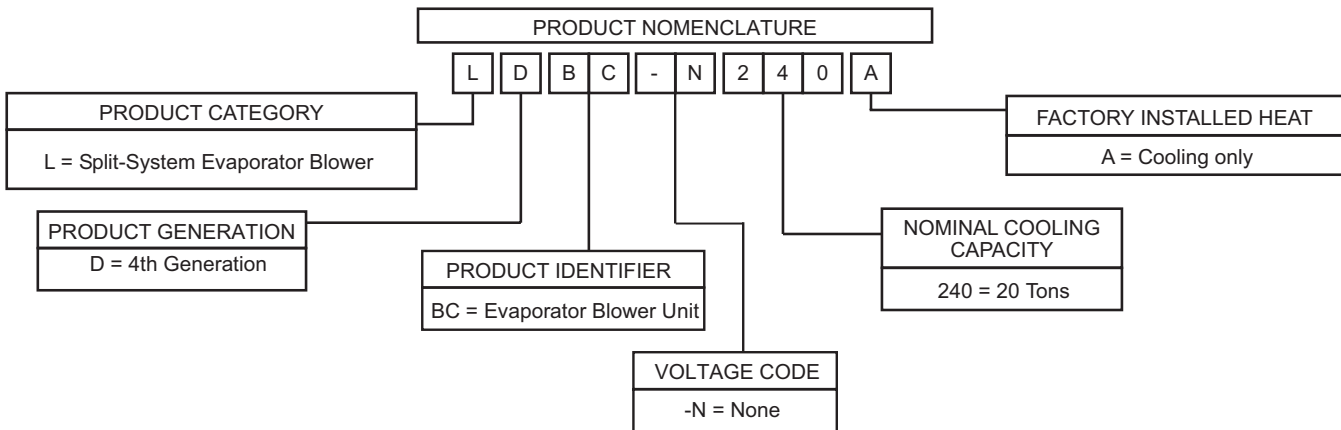
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ACCESSORIES

RETURN AIR GRILLE - This decorative, expanded metal grille will enhance the appearance of any unit that has no return air ductwork and is especially recommended for units located within the conditioned space.

SUPPLY AIR PLENUM - This decorative, horizontal discharge plenum will enhance the appearance and performance of any unit that does not have supply air ductwork. It has the same durable finish as the evaporator blower, is fully insulated, is shipped ready for mounting on horizontal or vertical units and has grilles which may be adjusted to meet the throw and spread requirements of the conditioned space.

BASE SECTION - The base section can be used to elevate units off the floor. If desired, outdoor air may be introduced thru these sections by cutting an access opening to accommodate the outdoor air duct connection. The base has a durable finish to match the evaporator blower unit. It may have to be insulated for certain applications.

SUSPENSION PACKAGE - This accessory can be used to suspend horizontal units from above without interfering with access to the unit. It can also be used for elevating a floor-mounted unit (either horizontal or vertical) to provide additional height for the installation of a trap at the condensate drain connection. A suspension package can be used with vibration isolators.

HOT WATER COIL - A drainable water coil is available for field installation between the blower and the coil modules of both horizontal and vertical units. Since their casings match the dimensions and the finish of the basic units, they become an integral part of the unit after installation. The coil slides out

of its casing for easy installation. The coil has copper tubes that have been mechanically expanded into aluminum fins. Both headers are located on the same end of the coil. Each coil is leak-tested at 325 psig under water and dried before their connections are capped for storage and shipping.

STEAM COIL - A steam coil is available for field installation between the blower and coil modules of both horizontal and vertical units. Since their casings match the dimensions and the finish of the basic units, they become an integral part of the unit after installation. The coil slides out of its casing for easy installation and is pitched in its casing to facilitate condensate drainage. The coil has copper tubes that have been mechanically expanded into aluminum fins. Both headers are located on the same end of the coil. Each coil is leak-tested at 325 psig and dried before their connections are capped for storage and shipping.

BLOWER MOTORS - Different HP motors are available to meet almost any air delivery requirement. All motors are UL approved, have inherent protection, permanently lubricated ball bearings and get field-mounted within the insulated cabinet of the unit to minimize the transmission of sound to the surrounding space. **Power wiring for the blower motor is field supplied.**

DRIVE PACKAGES - Different size pulleys and belts are available to provide a blower RPM range to meet almost any air delivery requirement. Variable pitch motor pulleys can be adjusted to provide the proper blower RPM. All drive packages are rated at least 25% above the nominal HP rating of the blower motor. Two-groove pulleys and two belts are provided on every drive package rated at 5 HP.

TABLE 1: PHYSICAL DATA - UNIT AND ACCESSORIES

| Component | Description | Model | |
|--|--|-------------|-----|
| | | 240 | |
| Evaporator Coil | Rows Deep | 3 | |
| | Rows High | 32 | |
| | Finned Length (in.) | 82.7 | |
| | Fins / Inch | 13 | |
| | Tube OD (in.) | 3/8 | |
| | Face Area (sq. ft.) | 18.4 | |
| Centrifugal Blowers | Wheel Dia. x Width (in.) (2 Per Unit) | 15 x 12 | |
| Filters (Throwaway) (8 Req'd) | Size (in.) | 20 x 22 x 1 | |
| | Face Area (sq. ft.) | 24.1 | |
| Operating Charge | Refrigerant-22 Lbs.-Oz. | 7.4 | |
| Drainable, Hot Water Coil Accessory | Rows Deep | 2 | |
| | Fins / Inch | 8 | |
| | Tube OD (in.) | 1/2 | |
| | Face Area (sq. ft.) | 14.5 | |
| | Supply/Return (Copper) OD (in.) | 1-3/8 | |
| Non-Freeze, Steam Distributing Coil Accessory | Rows Deep | 1 | |
| | Fins / Inch | 8 | |
| | Tube OD x ID (in.) | 1 x 5/8 | |
| | Face Area (sq. ft.) | 13.5 | |
| | Inlet/Outlet (Brass) NPTE (in.) | 1-1/2 | |
| Weight (Lbs.) | Shipping ¹ | 690 | |
| | Operating | 800 | |
| Accessory Operating Weight (Lbs.) | Motor & Drive | 3 HP | 90 |
| | | 5 HP | 120 |
| | Supply Air Plenum | 150 | |
| | Base | 120 | |
| | Return Air Grille | 15 | |
| | Steam Coil | 150 | |
| | Hot Water Coil | 150 | |

1. Less Motor and Drive.

TABLE 2: ELECTRICAL DATA

| Motor Rating | Power Supply | Nameplate Amps | MCA | Max. Fuse ¹ / Breaker ² Size (Amps) |
|--------------|--------------|----------------|------|--|
| 3 HP | 208-3-60 | 10.6 | 13.3 | 20 |
| | 230-3-60 | 9.2 | 11.5 | 15 |
| | 460-3-60 | 4.6 | 5.8 | 8 |
| 5 HP | 208-3-60 | 13.6 | 17 | 25 |
| | 230-3-60 | 13.4 | 16.8 | 25 |
| | 460-3-60 | 6.7 | 8.4 | 12 |

1. Dual element, time delay fuses.

2. HACR type per NEC.

TABLE 3: SUPPLY AIR BLOWER PERFORMANCE*

| RPM | CFM | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 6400 | | | 7200 | | | 8000 | | | 8800 | | | 9600 | | |
| | ESP | BHP | KW | ESP | BHP | KW | ESP | BHP | KW | ESP | BHP | KW | ESP | BHP | KW |
| 600 | 0.15 | 1.49 | 1.42 | - | - | - | - | - | - | - | - | - | - | - | - |
| 650 | 0.31 | 1.71 | 1.63 | 0.14 | 2.00 | 1.90 | - | - | - | - | - | - | - | - | - |
| 700 | 0.49 | 1.95 | 1.86 | 0.32 | 2.27 | 2.16 | 0.12 | 2.63 | 2.50 | - | - | - | - | - | - |
| 750 | 0.67 | 2.21 | 2.10 | 0.51 | 2.56 | 2.44 | 0.32 | 2.92 | 2.78 | 0.10 | 3.35 | 3.19 | - | - | - |
| 800 | 0.85 | 2.50 | 2.38 | 0.70 | 2.85 | 2.71 | 0.52 | 3.25 | 3.09 | 0.31 | 3.70 | 3.52 | 0.07 | 4.20 | 4.00 |
| 850 | 1.05 | 2.80 | 2.66 | 0.91 | 3.19 | 3.04 | 0.74 | 3.61 | 3.44 | 0.53 | 4.07 | 3.87 | 0.29 | 4.62 | 4.40 |
| 900 | 1.25 | 3.11 | 2.96 | 1.12 | 3.55 | 3.38 | 0.96 | 3.99 | 3.80 | 0.76 | 4.51 | 4.29 | 0.53 | 5.07 | 4.82 |
| 950 | 1.46 | 3.46 | 3.29 | 1.34 | 3.92 | 3.73 | 1.18 | 4.43 | 4.22 | 1.00 | 4.97 | 4.73 | 0.78 | 5.53 | 5.26 |
| 1000 | 1.67 | 3.82 | 3.64 | 1.56 | 4.33 | 4.12 | 1.42 | 4.88 | 4.64 | 1.24 | 5.44 | 5.18 | - | - | - |

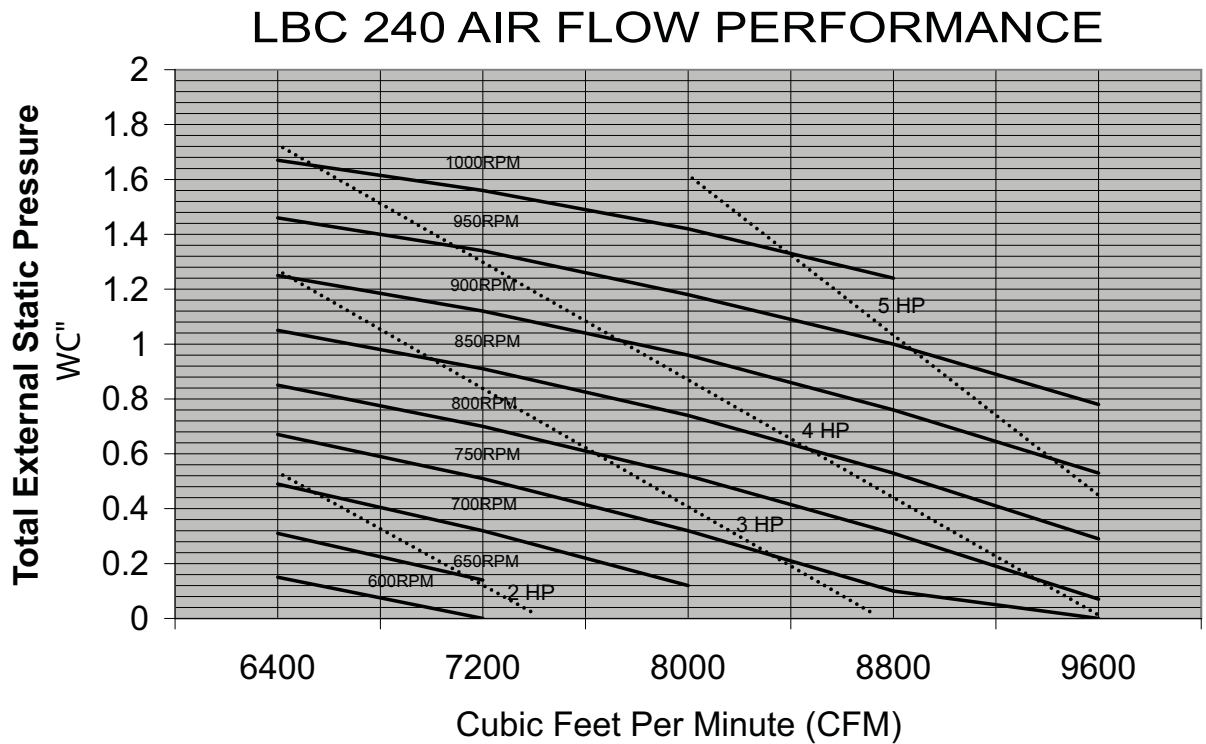


FIGURE 1 - AIR FLOW PERFORMANCE

* When determining required brake horsepower, select nearest HP to the right of selected CFM.

Horsepower ratings on the Airflow Chart are approximate values. To assure correct BHP, please refer to Supply air Blower Performance chart.

TABLE 4: BLOWER MOTOR AND DRIVE DATA

| Drive Accessory Model No. | Motor | | | | Belt | Blower Pulley | | Motor Pulley | |
|---------------------------|-----------|-----------------|-------|------------|------------------|---------------|-------------|--------------|-----------------|
| | RPM Range | HP ¹ | Frame | Shaft Size | | Mfgs. No. | Size | Mfgs. No. | Size |
| 1LD0404 | 600 - 775 | 3 | 56 | 7/8 | A55 | AK104 | 10 x 1-3/16 | 1VM50 | 3.4-4.4 x 7/8 |
| 1LD0406 | 775 - 970 | 5 | 184 | 1-1/8 | A57 ² | AK114 | 11 x 1-3/16 | 2VP71 | 5.2-6.2 x 1-1/8 |

- All motors are 1750 RPM and have a 1.15 service factor.
- Two matched belts.

TABLE 5: HOT WATER CAPACITY¹, MBH

| Hot Water Coil Accessory | Unit Model | GPM | CFM | Entering Water Temp. Minus Entering Air Temp., °F | | | | |
|--------------------------|------------|-----|------|---|-----|-----|-----|-----|
| | | | | 70 | 90 | 110 | 130 | 150 |
| 1HW0405 | 240 | 35 | 6400 | 179 | 229 | 280 | 331 | 382 |
| | | | 8000 | 199 | 255 | 312 | 369 | 425 |
| | | | 9600 | 220 | 282 | 344 | 407 | 469 |

- These capacities do not include any blower motor heat.
NOTE: Water Temperature Drop (°F) = 2 x MBH / GPM.

| Hot Water Coil Accessory | GPM | Pressure Drop ¹ PSI | Capacity Correction Factory |
|--------------------------|-----|--------------------------------|-----------------------------|
| 1HW0405 | 15 | 0.2 | 0.74 |
| | 35 | 0.8 | 1.00 |
| | 55 | 1.5 | 1.04 |
| | 75 | 2.5 | 1.06 |

- For pressure drop in feet (water), multiply these values by 2.31.

CAUTION: Do NOT operate a supply air blower motor above its nominal HP rating when a unit is equipped with a hot water coil accessory.
Do NOT use steam in these hot water coils.

TABLE 6: STEAM COIL CAPACITY¹, MBH @ 2 PSIG²

| Steam Coil Model | Unit Model | CFM | Dry Bulb Temperature Of Air Entering Coil, °F | | | |
|------------------|------------|------|---|-----|-----|-----|
| | | | 10 | 30 | 50 | 70 |
| 1NF0453 | 240 | 6400 | 402 | 364 | 325 | 286 |
| | | 8000 | 464 | 419 | 374 | 330 |
| | | 9600 | 481 | 435 | 388 | 342 |

- These capacities do not include any blower motor heat.
- Multiply these capacities by the following factors to correct for higher steam pressures.

| | | | | | |
|----------------------------|------|------|------|------|------|
| Steam pressure, psig | 5 | 10 | 15 | 20 | 25 |
| Capacity correction factor | 1.05 | 1.12 | 1.19 | 1.25 | 1.30 |

NOTE: Steam rate (lbs./hr) = 1.025 x MBH

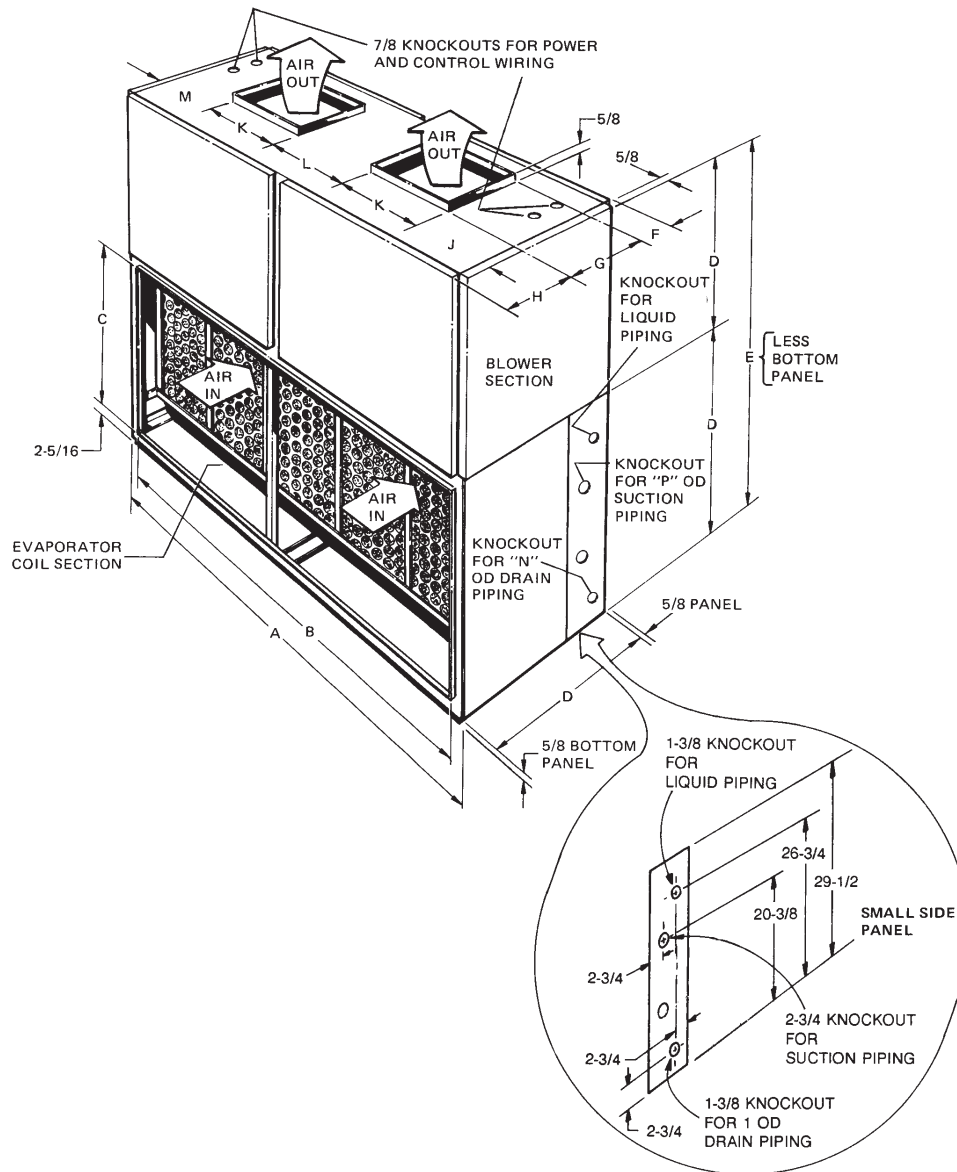
CAUTION: Do NOT operate a motor above its nominal HP rating when a unit is equipped with a hot water coil accessory.
Although these coils are suitable for much higher pressures, steam above 25 psig will provide too much heat and could damage the blower motor.

TABLE 7: ACCESSORY STATIC RESISTANCE (IWG)

| CFM | Supply Air Plenum | Return Air Grille | Non Freeze Steam Coil | Hot Water Coil |
|------|-------------------|-------------------|-----------------------|----------------|
| 6400 | .03 | .04 | .14 | .07 |
| 7200 | .03 | .05 | .17 | .08 |
| 8000 | .04 | .06 | .21 | .10 |
| 8800 | .05 | .07 | .25 | .12 |
| 9600 | .06 | .08 | .29 | .14 |

TABLE 8: PLENUM PERFORMANCE

| CFM | Throw, Feet | |
|------|-------------|---------|
| | Minimum | Maximum |
| 6400 | 80 | 145 |
| 8000 | 98 | 165 |
| 9600 | 115 | 185 |



All dimensions are in inches. They are subject to change without notice. Certified dimensions will be provided upon request.

FIGURE 2 - UNIT DIMENSIONS

| A | B | C | D | E | F | G | H | J | K | L | M | N | P |
|--------|----|--------|--------|----|--------|--------|---------|--------|----|----|--------|---|-------|
| 89-1/2 | 85 | 26-1/8 | 29-1/2 | 59 | 2-7/16 | 15-7/8 | 12-7/16 | 20-3/4 | 16 | 16 | 20-3/4 | 1 | 1-5/8 |

ACCESSORIES

- Heating Coil - Add 6 inches to overall unit height when used.
- Plenum - Add 24-5/8 inches to overall unit height when used.
- Base - Add 23-3/8 inches to overall unit height when used.

CLEARANCES

- 24 inches on one side for piping connection and access to blower motor.
- One inch on opposite side.
- One inch on rear.

ACCESSORY DIMENSIONS

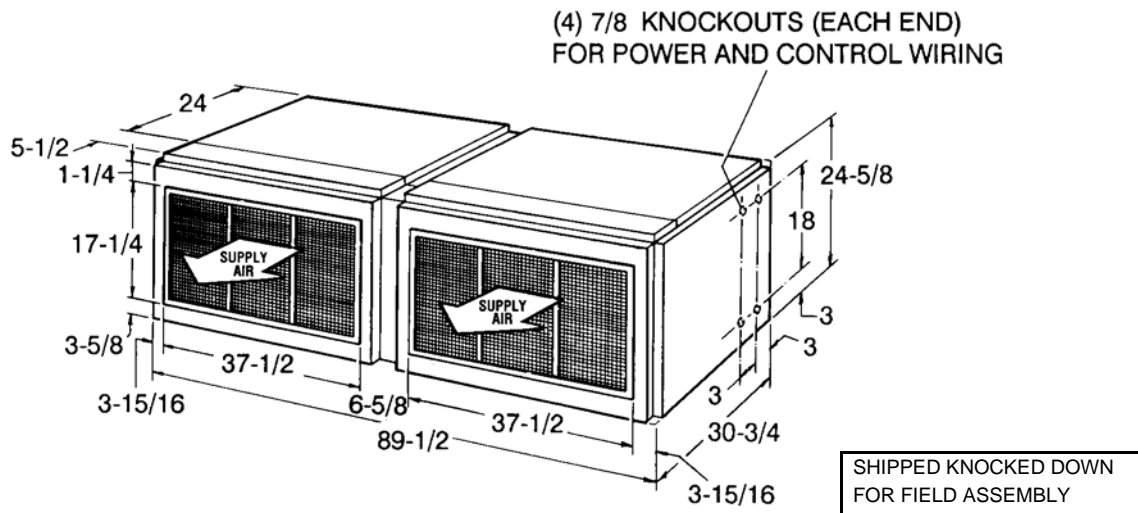


FIGURE 3 - SUPPLY AIR PLENUM - MODEL 1SP0405

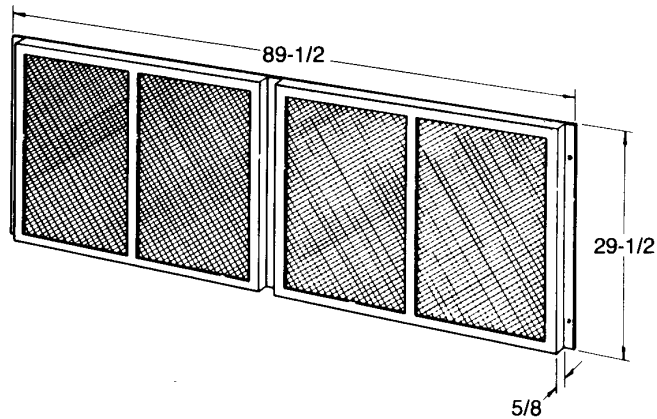


FIGURE 4 - RETURN AIR GRILLE - MODEL 1RG0405

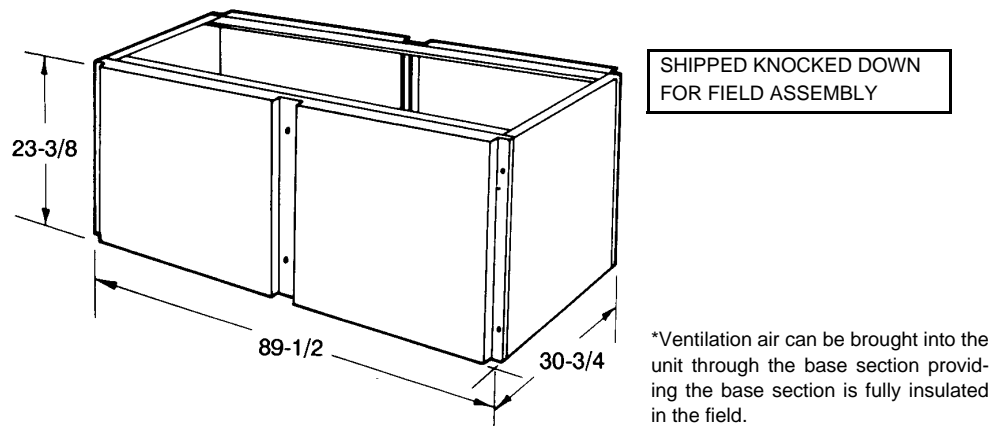
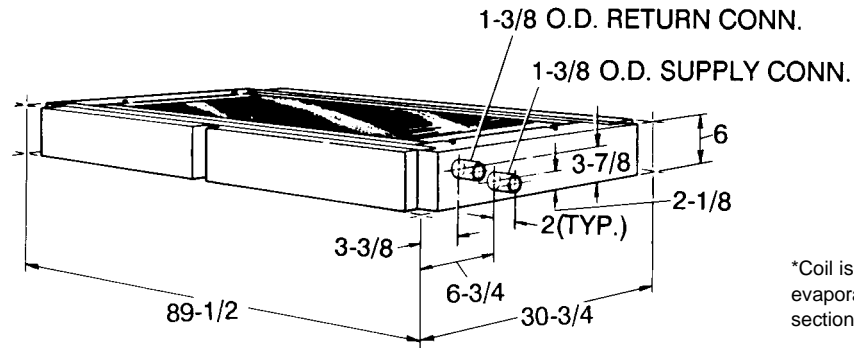
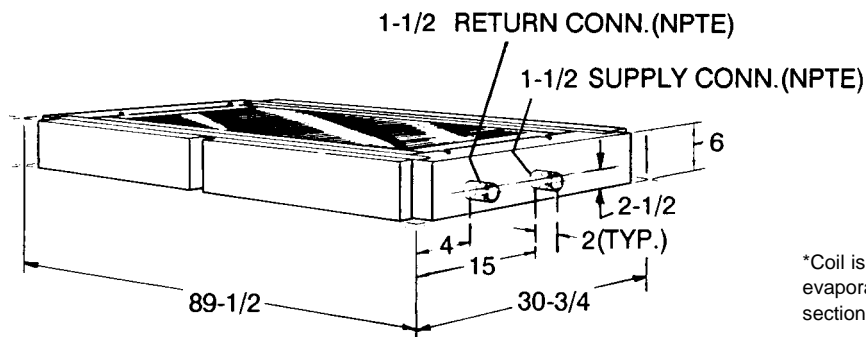


FIGURE 5 - BASE SECTION* - MODEL 1BS0405



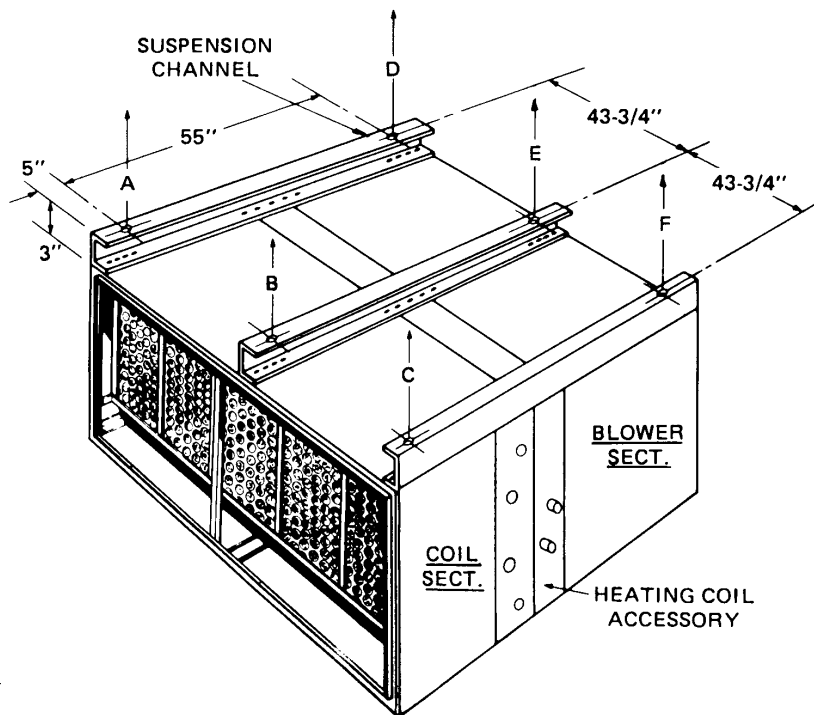
*Coil is field-installed between the evaporator coil and the blower section of the unit.

FIGURE 6 - HOT WATER COIL* - MODEL 1HW0405



*Coil is field-installed between the evaporator coil and the blower section of the unit.

FIGURE 7 - STEAM COIL* - MODEL 1NF0453



BASE UNIT SUSPENSION WEIGHTS (Lbs.)

| Suspension Point | w/3 HP Motor ¹ |
|------------------|---------------------------|
| A | 142 |
| B | 132 |
| C | 152 |
| D | 162 |
| E | 132 |
| F | 127 |
| Total Weight | 847 |

1. Motor location at suspension point "F".

FIGURE 8 - SUSPENSION KIT - MODEL 1HH0451

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